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A BIBLIOGRAPHY OF THE GEOLOGICAL, MINERALOGICAL AND PALEONTOLOGICAL LITERATURE OF THE STATE OF VIRGINIA

BY

THOMAS L. WATSON
Fellow in Cornell University

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A BIBLIOGRAPHY OF THE GEOLOGICAL, MINERALOGICAL AND PALEONTOLOGICAL LITERATURE OF THE STATE OF VIRGINIA.

BY

Thomas L. Watson.

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INTRODUCTION.

The author has for several years past been collecting and noting all references to literature bearing on the geology of the State of Virginia, with a view to publishing such memoranda sooner or later, mainly, for the convenience of future workers in the State. All workers in this State must have recognized the inaccessibility of a large part of the literature, caused by its greatly scattered condition, which is due almost entirely to the fact that, with few exceptions, all contributions have been made by individuals working independently of any organization. Their results were donated to and have been published in papers or periodicals of a more or less local character, and in some cases even these were of a brief existence. Apart from the unfortunately short-lived State Geological Survey, under the directorship of Professor William Barton Rogers—established during the year 1835 and continuing through 1841—and of recent years, the work of the United States Geological Survey, which has had parties in that field during each season, there has been

and is yet an entire absence of any organization or journal devoted to either general or special science in the State. Major Jed. Hotchkiss, of Staunton, Virginia, edited, during the years 1880–1885, a journal entitled, "The Virginias," and while it contained a large number of valuable contributions to Virginia as well as West Virginia geology, it was largely, if not exclusively, devoted to mining and engineering.

The literature is not by any means very extensive, or even approaching what might be termed voluminous, when compared with that of some of the other states, but the above conditions have certainly conspired to render its summation a very tedious and laborious task, carrying with it a considerable element of incompleteness.

This list is published under the title "Bibliography," but it might perhaps have been more correct to have inserted the word, "Partial," inasmuch as it is not a complete record of all the work; however, I feel safe in saying that it does represent by far the greater bulk of the material thus far contributed. I have avoided, as far as possible, the mere mention of Virginia in articles bearing on the geology of other territories. This has not been strictly adhered to in all cases, since many articles of much importance have been found in which reference, though very brief, was made to Virginia and which fully warranted their listing in this paper. This element is further increased, when the writings of the earlier workers are examined, as the work was done in what then was called Virginia, but since admitted into the Union as a separate state and is known as West Virginia, hence many of the earlier references which occur in this bibliography would more correctly find classification with the West Virginia literature.

I publish this with the hope of having my attention called to any and all publications which may have been omitted, by those who may find omissions. Since this paper has gone to press, I have had access to several publications containing a large amount of geologic material which has necessitated a rather large addenda.

I wish to make acknowledgments to many who have aided me in this publication, but especially to Prof. G. D. Harris, of Cornell University, who has constantly aided me in many ways by invaluable suggestions, and particularly by kindly accepting this as one of his series of Bulletins, insuring thereby prompt publication.

LIST OF THE PRINCIPAL JOURNALS CONSULTED; With Abbreviations.

Amer. Jour. Sci., or A. J. S.—The American Journal of Science, sometimes called Silliman's Journal.
Amer. Nat.—The American Naturalist.
Amer. Chem. Jour.—The American Chemical Journal.
Amer. Geol.—The American Geologist.
Ann'l Rep't Smithsonian Inst.—Annual Report of the Smithsonian Institution.
Ann'l Rep't U. S. Geol. Surv.—Annual Report of the United States Geological Survey.
Ann'l Rep't Geol. Surv. Pa.—Annual Report of the Geological Survey of Pennsylvania.
Ann'l Rep't Geol. Surv. Va.—Annual Report of the Geological Survey of Virginia.
An. Lyc. Nat. Hist. N. Y—Annals of the Lyceum of Natural History of New York.
Bull. Geol. Soc. Amer.—Bulletin of the Geological Society of America.
Bull. Geol. Soc. France.—Bulletin of the Geological Society of France.
Bull. Phil. Soc. Wash.—Bulletin of the Philosophical Society of Washington, D. C.
Bull. U. S. Geol. Surv.—Bulletin of the United States Geological Survey.
Census U. S.—Census Report of the United States.
Chem. News.—The Chemical News, London.
Engr. and Min. Jour.—The Engineering and Mining Journal.
Geol. Mag.—The Geological Magazine, London.
Geol. Record.—The Geological Record, London.
Geol. Soc. Wash.—The Geological Society of Washington, D. C.
Jour. Chem. Soc.—Journal of the Chemical Society, London.
Jour. Acad. Nat. Sci. Phila.—Journal of the Academy of Natural Sciences, Philadelphia.
Jour. Geol.—Journal of Geology, Chicago.
J. H. Univ. Cir.—Johns Hopkins University Circulars.

McFarlane's Geol. Ry. Guide.—McFarlane's Geological Railroad Guide.

Mem. Amer. Acad. Arts and Sci.—Memoirs of the American Academy of Arts and Sciences.

Min. Res. U. S.—Mineral Resources of the United States.

Min. Jour.—Mining Journal of London.

Mon. U. S. Geol. Surv.—Monograph of the United States Geological Survey.

Pop. Sci. Mon.—The Popular Science Monthly.

Proc. Amer. Phil. Soc.—Proceedings of the American Philosophical Society, Philadelphia.

Proc. Amer. Assoc. Adv. Sci., or A. A. A. S.—Proceedings of the American Association for the Advancement of Science.

Proc. Amer. Acad. Arts and Sci.—Proceedings of the American Academy of Arts and Sciences, Boston, Mass.

Proc. Acad. Nat. Sci. Phila.—Proceedings of the Academy of Natural Sciences, Philadelphia.

Proc. Boston Soc. Nat. Hist.—Proceedings of the Boston Society of Natural History.

Proc. U. S. Nat. Mus.—Proceedings of the United States National Museum.

Quart. Jour. Geol. Soc., or Q. J. G. S.—Quarterly Journal of the Geological Society, London.

Sci.—Science.

Trans. Amer. Geol. Soc.—Transactions of the American Geological Society.

Trans. Amer. Inst. Min. Engrs.—Transactions of the American Institute of Mining Engineers.

Trans. Amer. Phil. Soc.—Transactions of the American Philosophical Society.

Trans. Acad. Sci. N. Y.—Transactions of the Academy of Sciences of New York.

Trans. Assoc. Amer. Geol. and Nat.—Transactions of the Association of American Geologists and Naturalists.

Trans. Geol. Soc. Pa.—Transactions of the Geological Society of Pennsylvania.

Trans. Geol. Soc. London.—Transactions of the Geological Society of London.

Trans. Geol. Soc. Manches.—Transactions of the Geological Society of Manchester.

Trans. Wag. Free Inst. Sci.—Transactions of the Wagner Free Institute of Science, Philadelphia.

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The following is the explanation of the figures:—
FIG. I (p. 163). Map or ground plan of an Estate called "Rappahannock or Smith's Gold Mine" in Stafford County, Virginia.
FIG. II (p. 164). Transverse section of the vein or load when looking towards the north-east in the shafts Nos. 3 and 4.
FIG. III (p. 165). Longitudinal section of the country in the direction of the central vein, taken by eye estimation without instruments.

FIG. IV (p. 166). Transverse section of the vein or load when looking towards the north-east in the deep shaft No. 10.

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Amer. Jour. Sci., vol. xxii, pp. 90-95, 1832.
For Virginia, see p. 95.

P

Phillips, J. A., & Louis, Henry, Treatise on Ore Deposits.
Macmillan & Co., Ltd., London, 1896. xxii & 943 pp., 128 illus.
For U. S., see pp. 740-829, in which Virginia is referred to.

Platt. (See under McCreath, A. S.).

Porcher, S., (See under Students of the University of Virginia).

R

Rogers, H. D., Report on the Salt and Gypsum of the Preston Salt Valley of the Holstein River.
Amer. Jour. Sci., 2d ser., vol. xviii, pp. 273-274, 1854.

Rogers, Wm. B., On the Limits of the Infusorial Stratum in Virginia.
Amer. Jour. Sci., vol. xlv, pp. 313-314, 1843.
Communicated by H. D. Rogers.
Extract from a letter by Prof. Wm. B. Rogers to the junior editor, dated Richmond, Dec. 13, 1843.

——— The Tertiary Infusorial Formation of Maryland.
Amer. Jour. Sci., vol. xlvi, pp. 141-142, 1844.

——— Oyster Shell (Ostrea virginica) Found Lying over the Newest Tertiary, near the Mouth of the Rappahannock River. Post Pliocene Age.
Proc. Boston Soc. Nat. Hist., vol. v, p. 268, 1854-56.
Statement only.

——— The Deoxidation of Sulphuric Acid in the Tertiary Clays and Sands of Maryland and Virginia.
Proc. Boston Soc. Nat. Hist., vol. v, pp. 152-154, 1854-56.

——— Western Belt of North Carolina and Virginia and Its Extension toward the Northeast, Forming the So-called New Red Sandstone of Virginia, Pennsylvania and New Jersey, and probably of the Valley of the Connecticut.
Proc. Boston Soc. Nat. Hist., vol. v, pp. 16-18, 1854-56.

——— Lignite from Virginia and North Carolina.
Proc. Boston Soc. Nat. Hist., vol. v, pp. 186, 189, 1854-56.

——— Theory of the Origin and Accumulation of the Protocarbonate of Iron in Coal Measures.
Proc. Boston. Soc. Nat. Hist., vol. v, pp. 283-290, 1854-56.

——— On the Growth of Stalactites in Virginia Caves.
Proc. Boston Soc. Nat. Hist., vol. v, pp. 336, 337, 1854-56.
The Virginias, vol. v, p. 24, 1884.

Ryder, Jno. A., (See under White, Chas. A.).

S

Sloan, B. E., (See under Students of the University of Virginia).

LIST BY SUBJECT AND YEAR.

Geology, Dynamic and Physiographic.

1782. Marquis de Chastelleux.
1783. Lincoln, B.
1793. Greenway, J.
1799. Hewson, Dr., Latrobe, B. H., Williams, J.
1806. Chevallie, J. A.
1817. Maclure, W.
1818. Gilmer, F. W.
1819. Cornelius, E., Grammer, J., Kain, J. H.
1821. Nuttall, T.
1825. Jefferson, Thos.
1834. Rogers, H. D., Rogers, J. B., Rogers, W. B.
1835. Clemson, T. G., Featherstonhaugh, G. W., Rogers, W. B.
1837. Prolix, P.
1839. Daubeny, C.
1840-42. Rogers, H. D., Rogers, W. B.
1843. Hayden, C. B., Murchison, R. I.
1848. Rogers, W. B.
1854. Rogers, W. B.
1854-56. Rogers, W. B.
1855. Rogers, W. B.
1859-61. Rogers, W. B.
1862. Lesley, J. P.
1868. Maury, M. F.
1869. Safford, J. M.
1870. Shaler, N. S.
1871. Lesley, J. P., Shaler, N. S.
1873. Hunt, T. S., Stevens, R. P.
1874. Fontaine, W. M., Hunt, T. S.
1875. Ansted, D. T., Fontaine, W. M., Rogers, W. B., Stevenson, J. J., Webster, N. B.
1876. Abert, S.T., Fontaine, W. M., Hotchkiss, J., Wallace, C.M.
1877. Young.
1878. Hotchkiss, J.
1879. Campbell, J. L., Chickering, jr., J. W., McDonald, M., Stevenson, J. J.
1880. Campbell, J. L., McDonald, M., Stevenson, J. J.

1881. Dunnington, F. P., Fontaine, W. M., Hotchkiss, J., Lewis, H. C., Stevenson, J. J., White, C. A.
1882. Dunnington, F. P., Fontaine, W. M., Hitchcock, C. H., Hotchkiss, J., Lesley, J. P., Rogers, W. B.
1883. Hotchkiss, J., Kerr, W. C., Smock, J. C., White, I. C.
1884. Ashburner, C. A., Campbell, J. L., Hotchkiss, J., Rogers, W. B., Stevenson, J. J., Warner, C. D.
1885. Ashburner, C. A., Campbell, J. K., Dunnington, F. P., Fontaine, W. M., Hotchkiss, J., McGee, W J.
1886. McGee, W J.
1887. Britton, N. L., Claypole, E. W., McGee, W J, Stevenson, J. J., White, I. C.
1888. Clifford, W., McGee, W J, Shaler, N. S., Willis, B.?
1889. Clifford, W., Clinch, Curtice, C., McGee, W J, Russell, I. C., Shaler, N. S.
1890. Chester, F. D., Darton, N. H., Diller, J. S., McGee, W J, Minor, F., Woolman, L.
1890-91. McGee, W J.
1891. Darton, N. H., Davis, W. M., Geiger, H. R., Keith, A., Hayes, C. W., Hitchcock, C. H., Lindenkohl, A., McGee, W J., Russell, I. C., Shaler, N. S., Spencer, J. W., Williams, G. H., Willis, B.
1891-92. Gannett, H., Willis, B.
1892. Baskerville, C., Keith, A., Mitchell, R. H.
1893. Cobb, C., Darton, N. H., Keith, A., Stevenson, J. J., Whitehead, T.
1894. Bache, F., Campbell, M. R., Darton, N. H., Shaler, N. S., Spencer, J. W.
1895. Spencer, A. C.
1896. Campbell, M. R., Hayes, C. W., Schmitz, E. T., Willis, B.

Paleontology and Stratigraphic Geology.

1774-1848. Greenway, J.
1783. Lincoln, B.
1798. Beauvois, M., Jefferson, T.
1799. Jefferson, T.
1824. Finch, J.
1826. Pierce, J.
1829. Morton, S. G.
1832. Lea, I.
1833. Conrad, T. A.

1834. Brongniart, Conrad, T. A., Morton, S. G., Rogers, H. D.
1835. Conrad, T. A., Rogers, H. D., Rogers, W. B., Taylor, R. C.
1836. Hildreth, S. P., Morton, S. G.
1839. Rogers, H. D., Rogers, W. B.
1840. Rogers, W. B.
1840-42. Bailey, J. W., Conrad, T. A., Hodge, J. J., Rogers, H. D., Rogers, W. B.
1841. Redfield, W. C.
1841-43. Bailey, J. W., Murchison, R. I., Rogers, H. D.
1842. Conrad, T. A., Lyell, C., Tuomey, M.
1843. Lea, H. C., Rogers, W. B.
1844. Bailey, J. W., Rogers, W. B.
1845. Lonsdale, W., Lyell, C.
1847. Bunbury, C. J. F.
1848. Conrad, T. A.
1849. Lyell, C.
1850. Ruffin, E.
1850-54. Leidy, J., Wyman.
1852. Lyell, C.
1852-53. Leidy, J.
1853. Hitchcock, E.
1854. Rogers, W. B.
1854-56. Rogers, W. B.
1858-60. Gabb, W. M.
1859. Leidy, J.
1859-61. Rogers, W. B.
1860. Rogers, W. B.
1863. Meek, F. B.
1864. Conrad, T. A.
1865. Conrad, T. A,
1867. Cope, E. D.
1873. Leidy, J.
1874. Fontaine, W. M.
1874-78. Meek, F. B.
1875. Bradley, F. H., Fontaine, W. M.
1876. Coryell, M., Stodder, C., White, I. C.
1877. Fontaine, W. M.
1878. Fontaine, W. M., Heinrich, O. J., White, I. C.
1879. Campbell, J. L., Fontaine, W. M., Heilprin, A., Kingsley, J. S., Rogers, W. B.
1880. Campbell, J. L., Coryell, M., Page, W. N., Rogers, W. B., Russell, I. C.

1881. Bailey, J. W., Campbell, J. L., Miller, S. A., Stodder, C.
1882. Fontaine, W. M., Heilprin, A., Hunt, T. S., Lewis, H. C., Lesley, J. P., Rogers, W. B.
1883. Elliott, J. B., Fontaine, W. M., Rogers, W. B.
1883-84. White, C. A., Heilprin, A., Ryder, J. A.
1884. Heilprin, A., Hunt, T. S., McCreath, A. S.
1884-86. Rogers, H. D.
1884-95. Heilprin, A.
1885. Campbell, H. D., Duncan, P. M., Lyell, C., McGee, W J.
1886. Newberry, J. S.
1886-87. Ward, L. F.
1887. Lesquereux.
1888. Clarke, J. M., Hall, J., Marsh, O. C., McGee, W J, Meyer, O., Newberry, J. S., Ward, L. F., Zeiller, R.
1888-89. Walcott, C. D.
1889. Dall, W. H., Fontaine, W. M., Knowlton, F. H., Russell, I. C., Stur, D.
1890. Clark, W. B., Dall, W. H., Lacoe, R. D., Marcou, J., McGee, W J.
1890-91. McGee, W J.
1891. Clark, W. B., Darton, N. H., Eyerman, J., Prosser, C. S., Walcott, C. D., White, C. A., White, I. C., Williams, H. S.
1892. Dall, W. H., Darton, N. H., Harris, G. D., Russell, I. C., Stevenson, J. J., VanHise, C. R., Walcott, C. D.
1893. Clark, W. B., Dall, W. H., Harris, G. D., Walcott, C. D.
1893-94. Ward, L. F.
1894. Harris, G. D., Lyman, B. S., Walcott, C. D.
1894-95. White, D.
1895. Clark, W. B., Cope, E. D.
1896. Clark, W. B., Fontaine, W. M., Marsh, O. C.
1897. Clark, W. B.

Mineralogy and Petrography.

1819. Cornelius, E.
1829. Cocke, J. H., Shepard, C. U.
1831. Hayden, H. H.
1835. Clemson, T. G.
1836. Shepard, C. U.
1842. Hubbard, O. P., Silliman, B., Rogers, W. B.
1843. Shepard, C. U.

1850. Johnson, W. R.
1854. Rogers, W. B.
1856. Rogers, W. B.
1866. Wurtz, H.
1869. Wurtz, H.
1871. Mallett, J. W.
1874. Tanner, J. A.
1874-75. Hunt, T. S.
1875. Mallett, J. W., Prime, jr., F., Wurtz, H.
1877. Brown, W. G., Koenig, G. A., Mallett, J. W.
1878. Mallett, J. W., Santos, J. R.
1880. Prime, jr., F., Rogers, W. B.
1881. Britton, J. B., Campbell, J. L., Dunnington, F. P., Heyward, B. H., Hotchkiss, J., Sloan, B. E.
1882. Baker, A. L. Campbell, J. L., Dunnington, F. P., Fontaine, W. M., Foote, A. E., Heyward, B. H., Koenig, G. A., Lewis, H. C., Lippitt, T. P., McCreath, A. S., Musgrave, R. N., Porcher, S., Rand, T. D., Seamon, W. H., Sloan, B. E., Rogers, W. B.
1883. Adams, W. H., Dunnington, F. P., Fontaine, W. M., Frazer, P., Haines, R., Hotchkiss, J., Mallett, J. W., McCreath, A. S., Musgrave, R. N., Page, W. T., Seamon, W. H., Sloan, B. E.
1884. Brown, W. G., Campbell, H. D., Fontaine, W. M., Hotchkiss, J., Kunz, G. F., Sloan, B. E.
1885. Bradbury, C. M., Cabell, J. M., Chappell, L. N., Dunnington, F. P., Hidden, W. E., Hunt, T. S., Page, C. C., Robertson, R., Rowan, G. H.
1887. Kunz, G. F., Riggs, R. B.
1888. Cowlan, G. B.
1890. Clarke, F. W., Genth, F. A., Venable, F. P.
1891. Brown, W. G., Campbell, H. D., Dunnington, F. P., Eakin, L. G., Hunt, T. S., Keyes, C. R., Kimball, J. P., Schneider, E. A., Williams, G. H.
1892. Eakin, L. G., Nitze, H. B. C., Pechin, E. C.
1893. Merrill, G. P., Williams, G. H.
1894. Goldsmith, E., Nason, F. L., Williams, G. H.
1896. Merrill, G. P., Pechin, E. C.

Economic Geology, Mines and Mining Statistics.

1809. Latrobe, B. H.
1819. Grammer, J., Kain, J. H.
1825. Robinson, S.
1834. Del Rio, A., Millington, J., Hayden, H. H.
1835. Clemson, T. G., Taylor, R. C.
1836. Hildreth, S. P.
1837. Maury, M. F., Silliman, B.
1838. Hunt, H.
1840. Taylor, S.
1841-43. Johnson, W. R.
1842. Wooldridge, A. S.
1843. Hayden, C. B.
1844. Johnson, W. R.
1852. Johnson, E. W.
1852-57. Rogers, W. B.
1853. Hitchcock, E.
1854. Whitney, J. D., Rogers, H. D.
1854-56. Rogers, W. B.
1856-59. Jackson, C. T.
1859-61. Richardson, J. W.
1862-64. Lesley, J. P.
1866. Bannan, B., Daddow, S. H., Evans, S. W., Lesley, J. P.
1867. Taylor, J. W.
1867-69. Credner, H., Lyman, B. S.
1870. Diss DeBarr, J. H.
1871. Credner, H., Mills, J. E.
1871-73. Heinrich, O. J.
1872. Imboden, J. D.
1873. Hunt, T. S., Lyman, B. S.
1874. Ansted, D. T., Goldsmith, E., Harden, J. W., Heinrich, O. J.
1875. Coryell, M., Prime, jr., F.
1876. Boyd, C. R., Heinrich, O. J., Maury, M. F., Fontaine, W. M.
1877. Frazer, P., Morton, J. H.
1878. Cresson, C. M., Morton, J. H.
1878-79. Firmstone, H.
1879. Pollard, T. P., Groddeck, A. Von.
1879-80. Boyd, C. R., Heinrich, O. J., Egleston, T.
1880. Becker, G. F., Beckwith, L. F., Bowron, W. M., Boyd,

C. E., Byrd, W., Campbell, J. L., Currey, R. O., Donald, W. A., Egleston, T., Emmons, S. F., Fink, H., Hotchkiss, J., Johnson, jr., C. F., King, C., McDonald, M., Moore, P. N., Morris, S. F., Peckham, S. F., Prime, jr., F., Pumpelly, R., Shaler, N. S., Shelley, E., Stegleman, C. M., Rogers, W. B., Weeks, J. D.

1881. Boyd, C. R., Buck, S. M., Campbell, J. L., Dewey, F. P., Donald, W. A., Drown, T. M., Egleston, T., Hotchkiss, J., Kimball, J. P., Lyman, B. S., Stevens, J. G., Stevenson, J. J.

1882. Campbell, J. L., Halsey, J. W., Hotchkiss, J., Lesley, J. P., Pollard, T., Porcher, S., Robertson, W., Rogers, W. B.

1882-83. Bowron, W. M., Fontaine, W. M., Frazer, P.

2883. Atkinson, W. G., Campbell, H. D., Campbell, J. L., Clerc, F. L., Fontaine, W. M., Hotchkiss, J., Howell, I. H., Kirchhoff, jr., C., Lathrop, W. A., McCreath, A. S., Platt, Raymond, R. W., Rogers, W. B., Smock, J. C., Williams, jr., A.

1883-84. Adams, W. H., Blake, W. P., Clarke, F. P., Day, D. T., Dewey, F. P., Martyn, W., Peale, A. C., Weeks, J. D., Williams, jr., A.

1884. Adams, W. H., Boyd, C. R., Campbell, H. D., Campbell, J. L., Chatard, T. M., Clarke, F. W., Fontaine, W. M., Froehling, H., Gifford, J. B., Gilham, W., Hotchkiss, J., Lathrop, W. A., McCreath, A. S., Robertson, W., Sheafer, P. W., Whitehead, T., Wise, F. N.

1884-85. Committee (Bramwell, J. H., Buck, S. M., Williams, E. H.).

1885. Ashburner, C. A., Benjamin, Boyd, C. R., Brock, R. A., Davis, F., Davis, H., Hotchkiss, J., Kimball, J. P., Kunz, G. F., Massie, F. A., Peale, A. C., Ruffner, W. H., Seamon, W. H., Silliman, B., Sproull, H. S., Stevenson, J. J., Swank, J. M., Weeks, J. D., Williams, jr., A., Winslow, A.

1886. Ashburner, C. A., Becker, G. F., Benjamin, M., Benton, E. R., Boyd, C. R., Chatard, T. M., Chauvenet, W. M., Day, D. T., Day, W. C., Lyman, B. S., Peale, A. C., Raborg, W. A., Rothwell, R. P., Swank, J. M., Wendt, A. F., Weeks, J. D., Vodges, A. W.

1886-87. D'Invilliers, E. V., McCreath, A. S.

1887. Ashburner, C. A., Day, D. T., Day, W. C., D'Invilliers, E. V., McCreath, A. S., Raborg, W. A., Russell, I. C.,

Swank, J. D., Weeks, J. D., Williams, jr., A.

1888. Ashburner, C. A., Day, D. T., Day, W. C., D'Invilliers, E. V., Hungerford, W. S., Killebrew, J. B., Kunz, G. F., McCreath, A. S., Means, E. C., Page, W. N., Peale, A. C., Proctor, J. R., Raborg, W. A., Swank, J. M., Weeks, J. D.

1889. Clarke, F. W., Chatard, T. M., Hillebrand, W. F., Killebrew, J. B., Ledoux, A. R., Newell, F. H., Pechin, E. C., Whitfield, J. E.

1889-90. Birkinbine, J., Day, D. T., Day, W. C., Kent, W., Parker, E. W., Peale, A. C., Raborg, W. A., Weeks, J. D.

1890. American Manufacturer, Ashburner, C. A., Birkinbine, J., Catlett, C., Childs, L. J., Day, D. T., Day, W. C., Emmons, S. F., Howard, E. L., Jones, J. H., Kunz, G. F., McDowell, F. H., Merrill, G. F., Middleton, J., Parker, E. W., Peale, A. C., Penrose, jr., R. A. F., Rothwell, R. P., Weeks, J. D., Whitfield, J. S., Wright, C. D.

1891. Birkinbine, J., Day, D. T., Day, W. C., Douglas, J., Hill, R. T., Jones, J. H., Parker, E. W., Pechin, E. C., Weeks, J. D.

1892. Benedict, W. DeL., Birkinbine, J., Childs, L. J., Day, D. T., Day, W. C., D'Invilliers, E. V., Edwards, W. S., Engelhardt, F. E., Hall, C. E., Holmes, J. A., Holmes, W. H., Johnson, G. R., Kunz, G. F., McCreath, A. S., Newberry, S. B., Nitze, H. B. C., Parker, E. W., Peale, A. C., Pechin, E. C., Penrose, jr., R. A. F., Phillips, W. B., Rothwell, R. P., Smith, W. A., Weeks, J. D., Yates, H. N.

1892-93, Campbell, M. R., Case, W. H., Kemp, J. F., Moxham, E. C., Peale, A. C.

1893. Adams, W. H., Birkinbine, J., Boyd, C. R., Day, D. T., Day, W. C., Fleming, H. S., Hill, R. T., Hopkins, T. C., Ingalls, W. R., Merrill, G. P., Newberry, S. B., Parker, E. W., Penrose, jr., R. A. F., Preston, R. E., Proctor, J. R., Ries, H., Rothwell, R. P., Ulke, T., Weeks, J. D.

1894. Darton, N. H., Emmons, S. F., Glenn, W., Weeks, J. D.

1894-95. Birkinbine, J., Boyd, C. R., Day, W. C., Parker, E. W., Rolker, C. M., Weeks, J. D.

1895. Tarr, R. S., Whitehead, T.

1896. Louis, H., Phillips, J. A.

Maps.

1873. Lesley, J. P.
1874. Rogers, W. B.
1875. Stevenson, J. J.
1876. Hotchkiss, J,, Rogers, W. B.
1879. Heinrich, O. J.
1880. Currey, R. O., Hotchkiss. J., Rogers, W. B.
1881. Hotchkiss, J., Lyman, B. S., Stevenson. J. J.
1882. Hotchkiss, J., Rogers, W. B.
1884. Yates, C. M.
1885. Hotchkiss, J., Lamb, R., McGee, W J.
1887. Stevenson, J. J.
1891. Boyd, C. R.
1895. Topographic Maps (U. S. Geol. Surv.).
1897. Geologic Atlas of the United States.

ERRATA.

Page 11, line 24: for Primoidal read Primordial.
" 37, " 5: for **Hodge, M. Jas.**, read **Hodge, Jas. M.**
" 61, " 7: insert paper after Nitze's.
" 74, " 26: for **Eakins, L. G.**, read **Eakin, L. G.**
" 75, " 22: for in the connection read in connection.